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Responsive Accurate Mission Module (RAMM)

New Army STO
III.WP.2001.01

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Fire Support Armaments Center

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Abstract

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19

Responsive Accurate Mission Module (RAMM)

III.WP.2001.01

Definition

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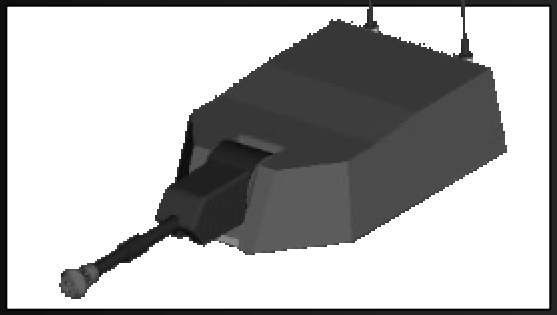
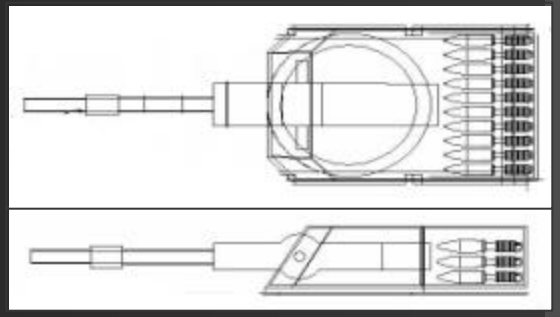
R A M M

Responsive Accurate Mission Module

- ***A lightweight responsive mobile unmanned 120mm mortar module that will provide accurate remote (SENSOR-TO-SHOOTER) capability through a digital network to engage Red Zone Targets.***





RAMM

- ***In 1998 FSAC, ARDEC developed the first unmanned 120mm mortar technology demonstrator called Dragon Fire for the USMC CWL which successfully demonstrated the utility of a remotely controlled indirect fire system. RAMM is a next phase in this development.***

Lethality without Soldier Vulnerability

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Responsive Accurate Mission Module (RAMM) Initial Concept Demonstrator

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- **Demonstrator Characteristics:**
  - **Unmanned/remote controlled after emplacement**
  - **Self-orienting/Self-positioning**
  - **Able to receive digital call for fire and MET data**
  - **Capable of internal ballistic computation for firing solutions**
  - **Automatic gun pointing, ammunition loading and firing**
  - **360 degree traverse firing**
  - **Transportable in V-22 aircraft**

- *Dragon Fire was a single shot, towed, remotely controlled Warfighting Technology Demonstrator.*
- *RAMM will leverage Dragon Fire's proven technology with many additional capabilities and enhancements for FCS.*

RAMM Module Concept

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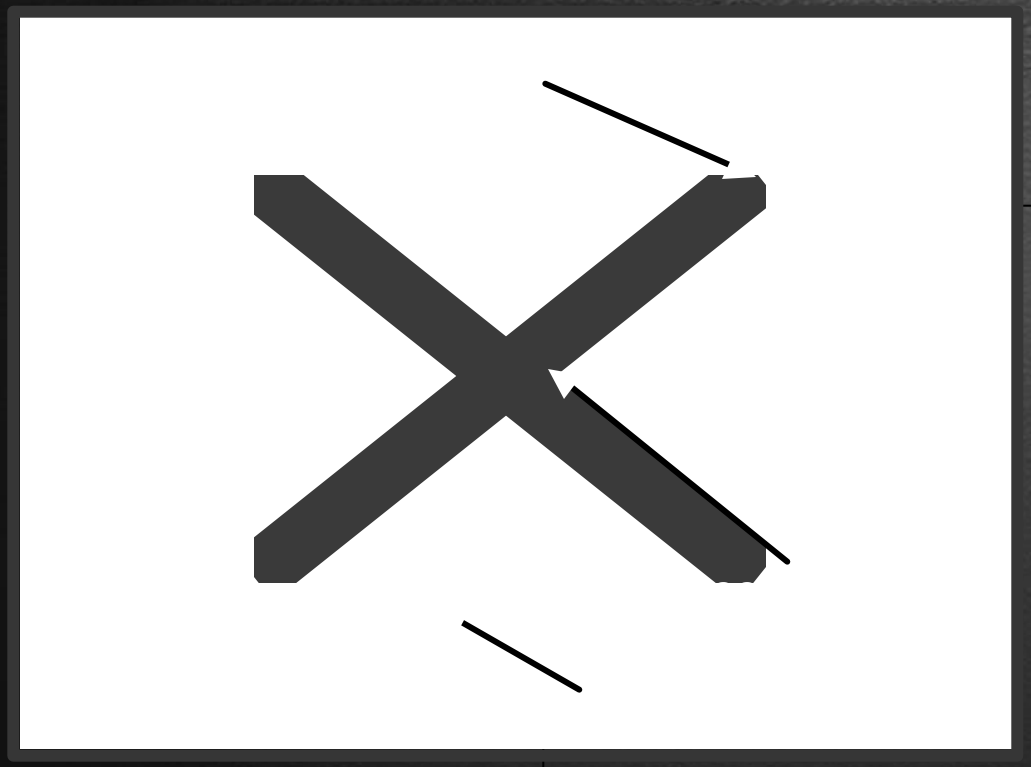

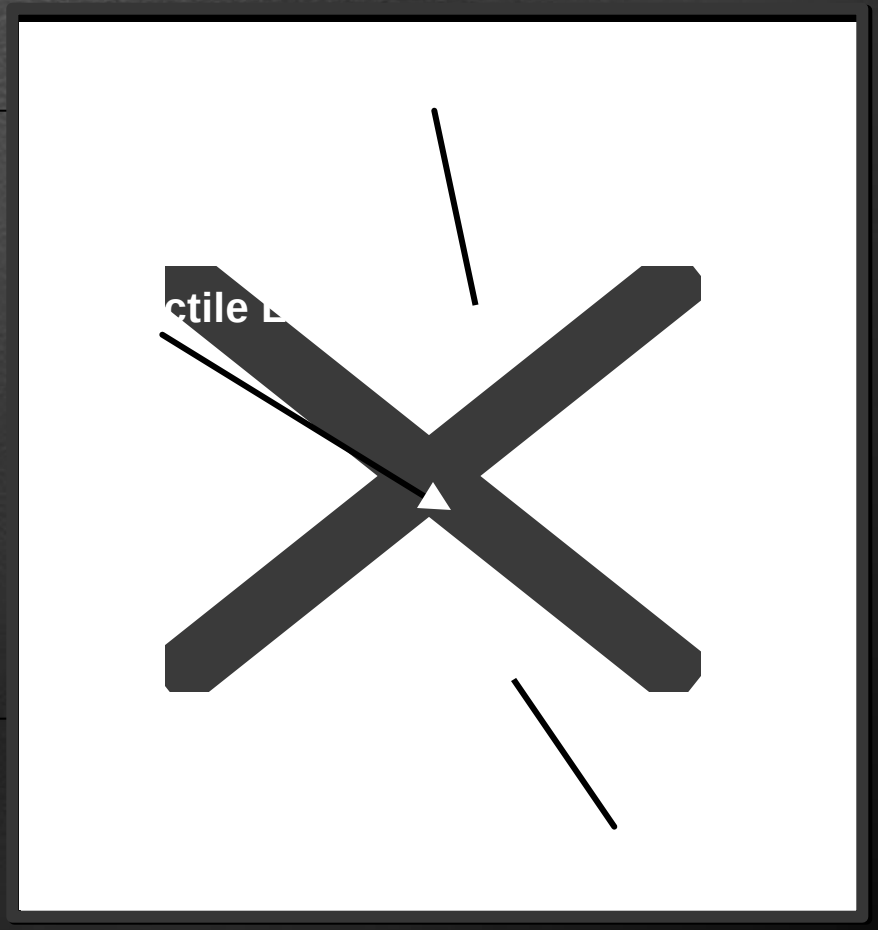

General Performance Objectives:

- *C130 Transportable*
- *Unmanned*
- *Module weight 4000-6000lbs*
- *Universal size and interface to fit on multiple FCS vehicle platforms*
- *Accurate automated gun pointing 0.5 – 1.0 mils, improved Nav and FO accuracies, MV compensation*
- *Responsive 11-15 sec round out from call for fire*

RAMM Module Concept on FCS and BCT Vehicles

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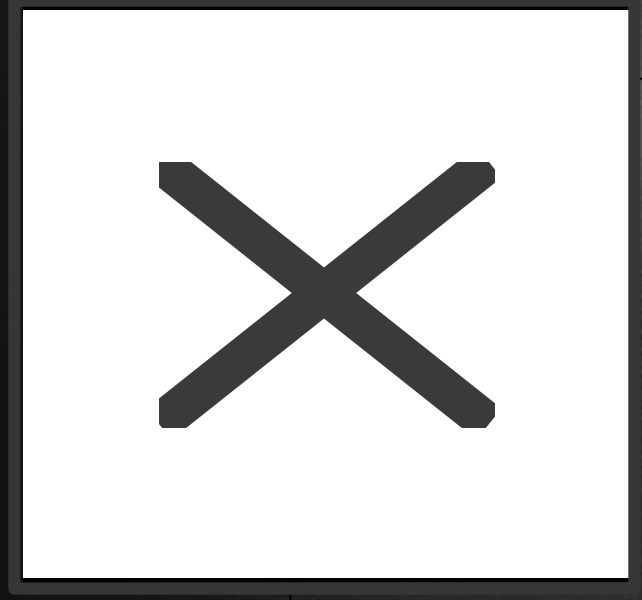
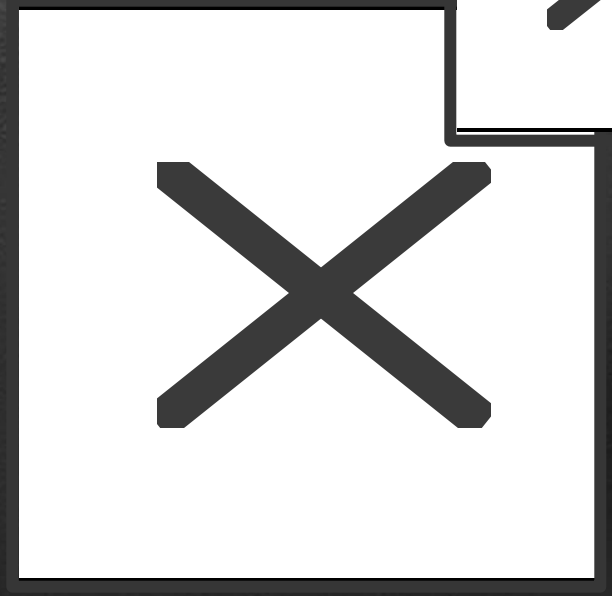
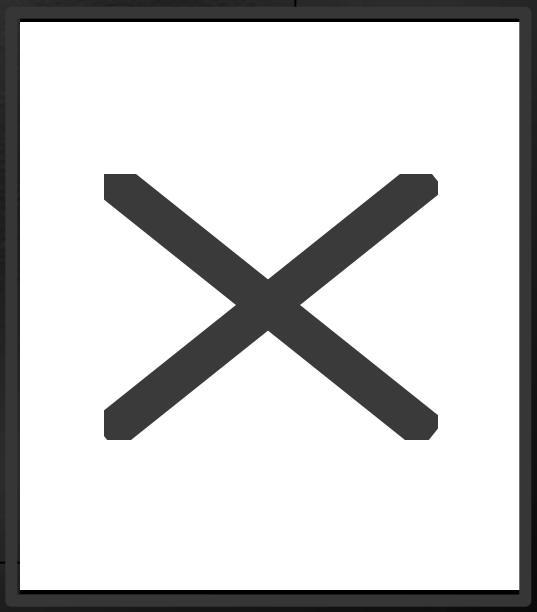


GENERIC FCS VEHICLE/RAMM IN C130 AND RAILWAY TUNNEL GAGE



RAMM MOUNTED ON GENERIC FCS VEHICLE



RAMM MOUNTED ON LAV III

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Responsive Accurate Mission Module

Why 120mm Mortar?

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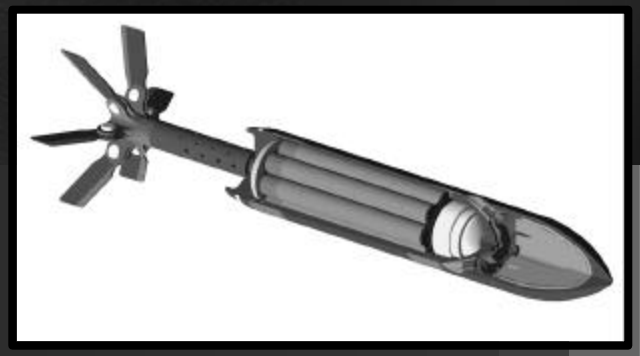
Advantages of 120mm Mortar:

- *Interoperability* ***many NATO 120mm mortar varieties are available***
- *Accuracy* ***PGMM for pin point accuracy, automated pointing will improve conventional round accuracy***
- *Lethality* ***Size allows for many stowed kills, (120mm, 65-85% lethality of current 155mm Artillery)***
- *Range* ***min-300 m (HE) 200m (Smoke/illumination), max-XM984 and PGMM will provide 15Km***
- *Simplicity for Automation* ***Round contains all components needed for firing (propellant/primer/etc).***
- *Relatively Lightweight* ***Armament envelope/weight/reaction loads are compatible w/ FCS size platforms***
- *Economy* ***advanced rounds are approaching end of development cycle, low conventional round cost***

PGMM

Conventional Rounds



XM984

Responsive Accurate Mission Module (RAMM) Basic Missions Concept

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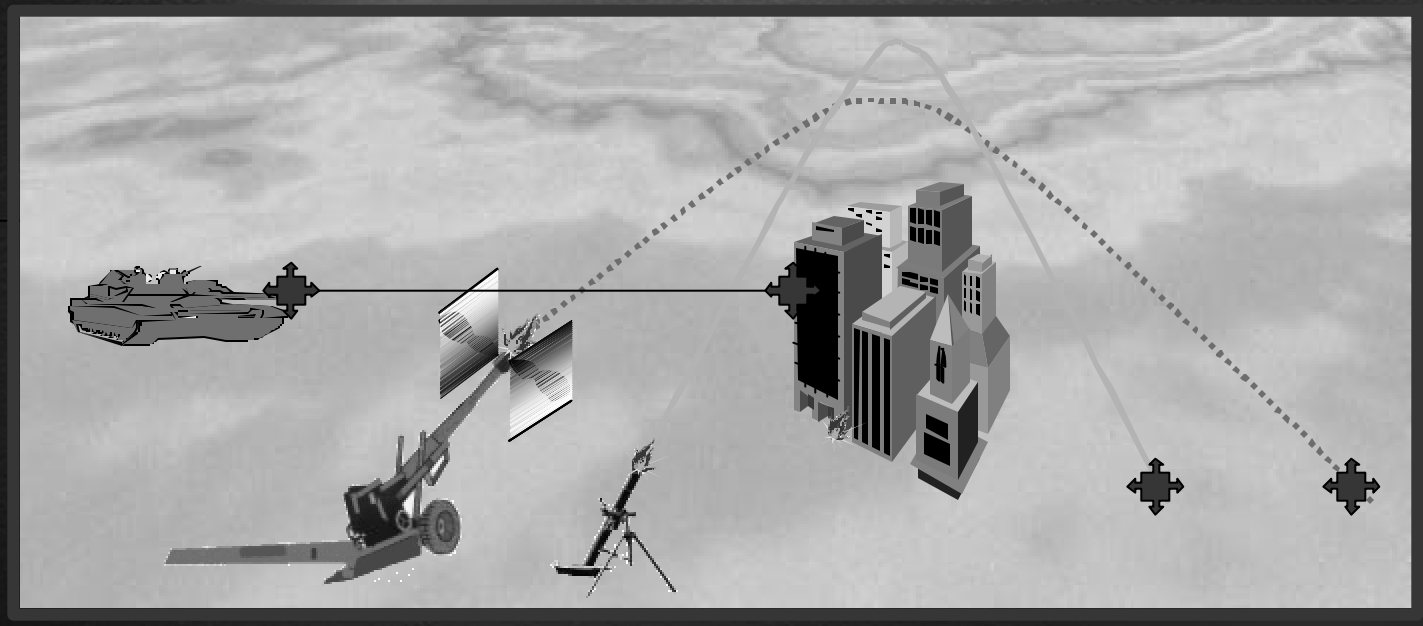
RAMM is a hybrid indirect fire system that combines select capabilities of traditional mortars, artillery and direct fire systems.



- *Indirect Suppressive Fire*
- *Indirect Target Degradation*
- *Indirect Harassment Fire*
- *Indirect Soft target strikes*
- *Smoke Screen Fire for obscuration*
- *Battlefield/Target Illumination*
- *Very High/Low Angle Fire for MOUT*
- *Limited Direct Fire Capability*
- *Precision Strike against bunkers, wall breeching and stationary hard targets*

Responsive Accurate Mission Module

Basic Control Network Architecture

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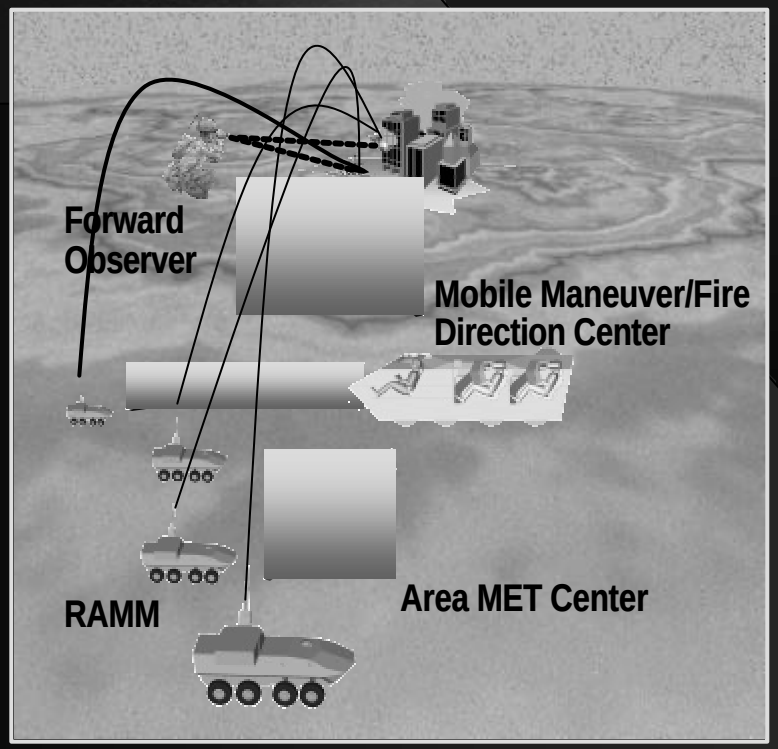
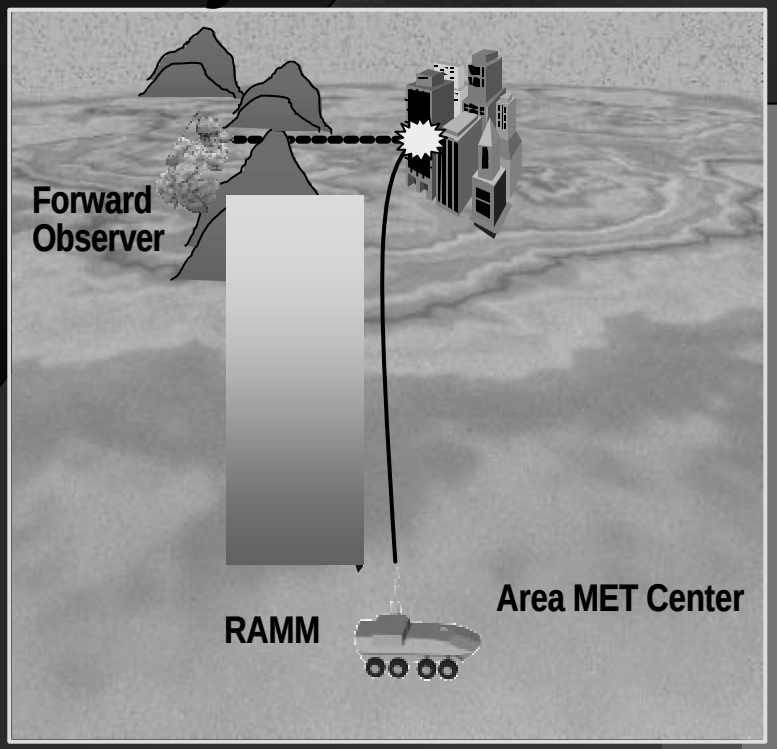
- Maneuver Direction Center → Mobile Platform Control
- Area MET Center → MET Data
- Forward Observer → Target Data
  - Forward Observer (Optional control) → TD/ Fire Mission
- Fire Direction Center → Fire Mission/Module Management
- RAMM Module → Fire Mission Processing

RAMM is a System of Systems



- Traditional Control Architecture



- Direct Control from FO (Aid in MOUT Combat)

Responsive Accurate Mission Module

Basic Networked Operation

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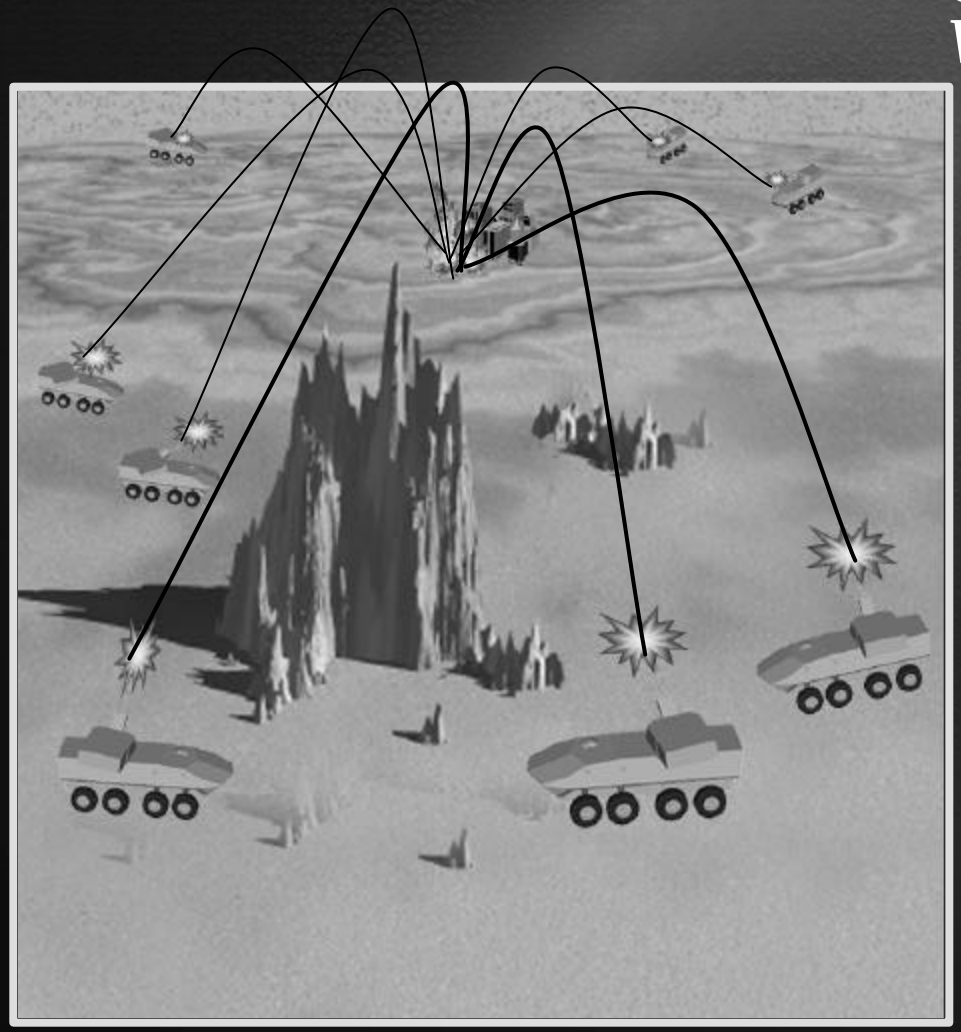
Widely dispersed RAMM systems can concentrate fire power on single or multiple targets to be used as a FORCE MULTIPLIER



Utilizing decision aids, the Future Warfighter will be able to:

- ***Achieve high ROF for effects by closely cycling multiple RAMM units***
- ***Confuse position location from counter battery fire through random fire from multiple locations***
- ***Optimize individual RAMM magazine inventory by firing select rounds from select RAMM systems***
- ***Digital networking will enhance tactics to compensate for systems damaged from battle***

RAMM is a System of Systems

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RAMM is Evolutionary *Near term planned capabilities*

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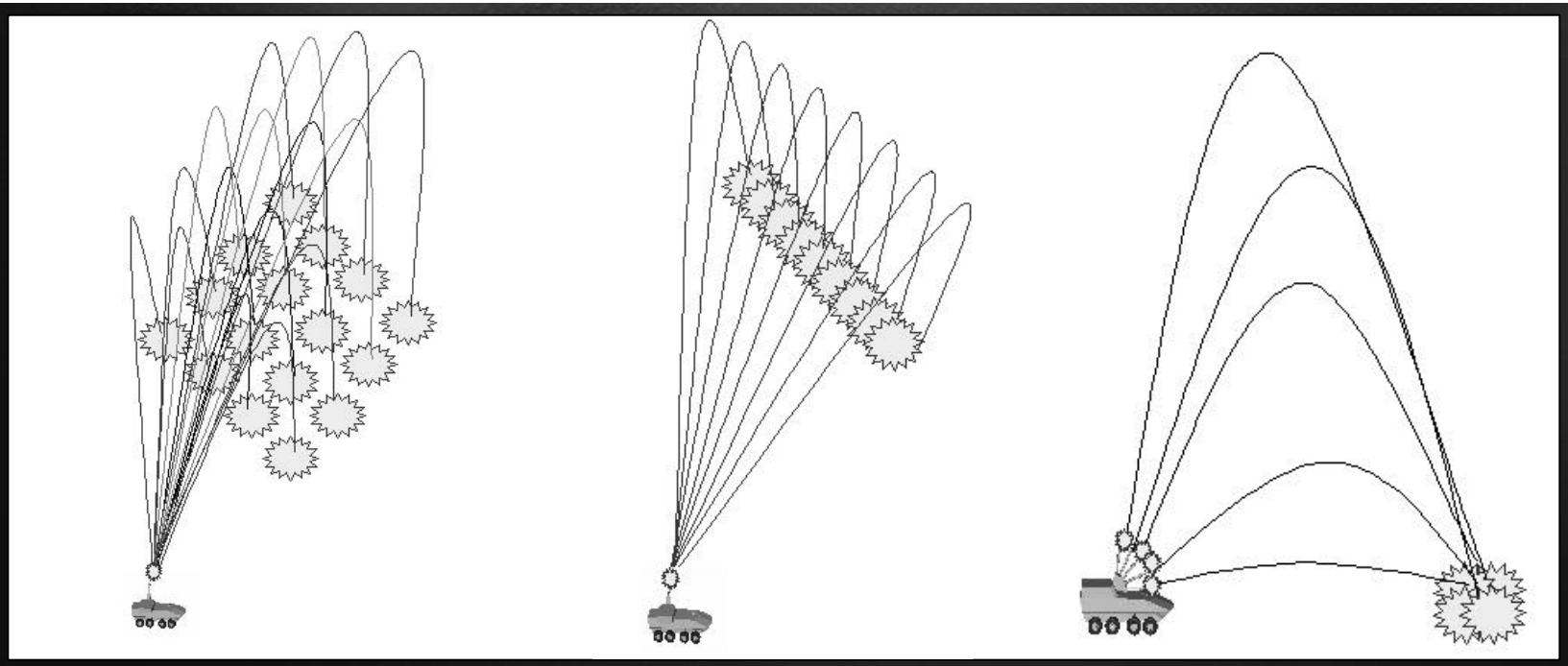
RAMM is a "building block system" where higher levels of intelligence/capabilities can be accomplished by means of software and tactical development



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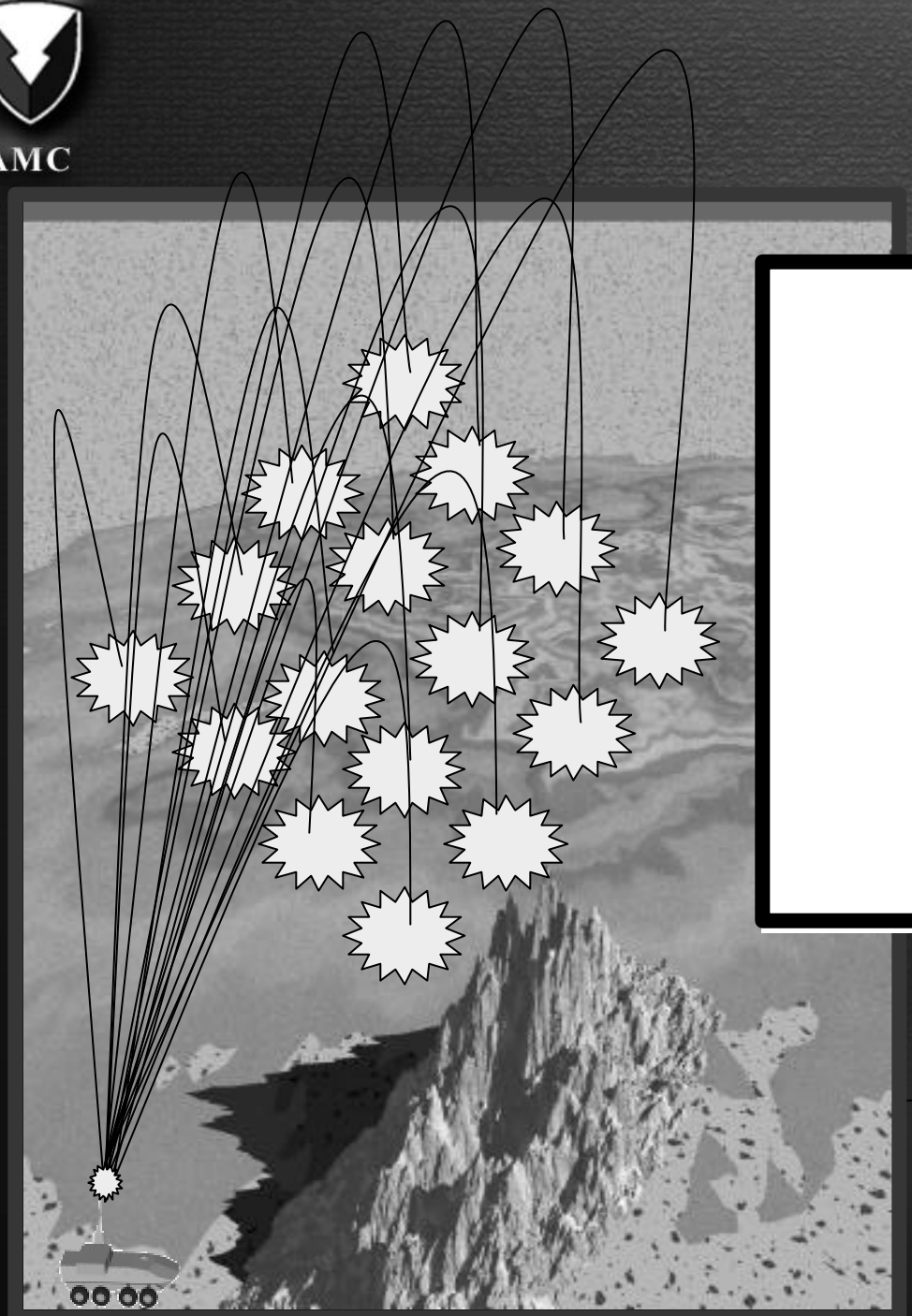
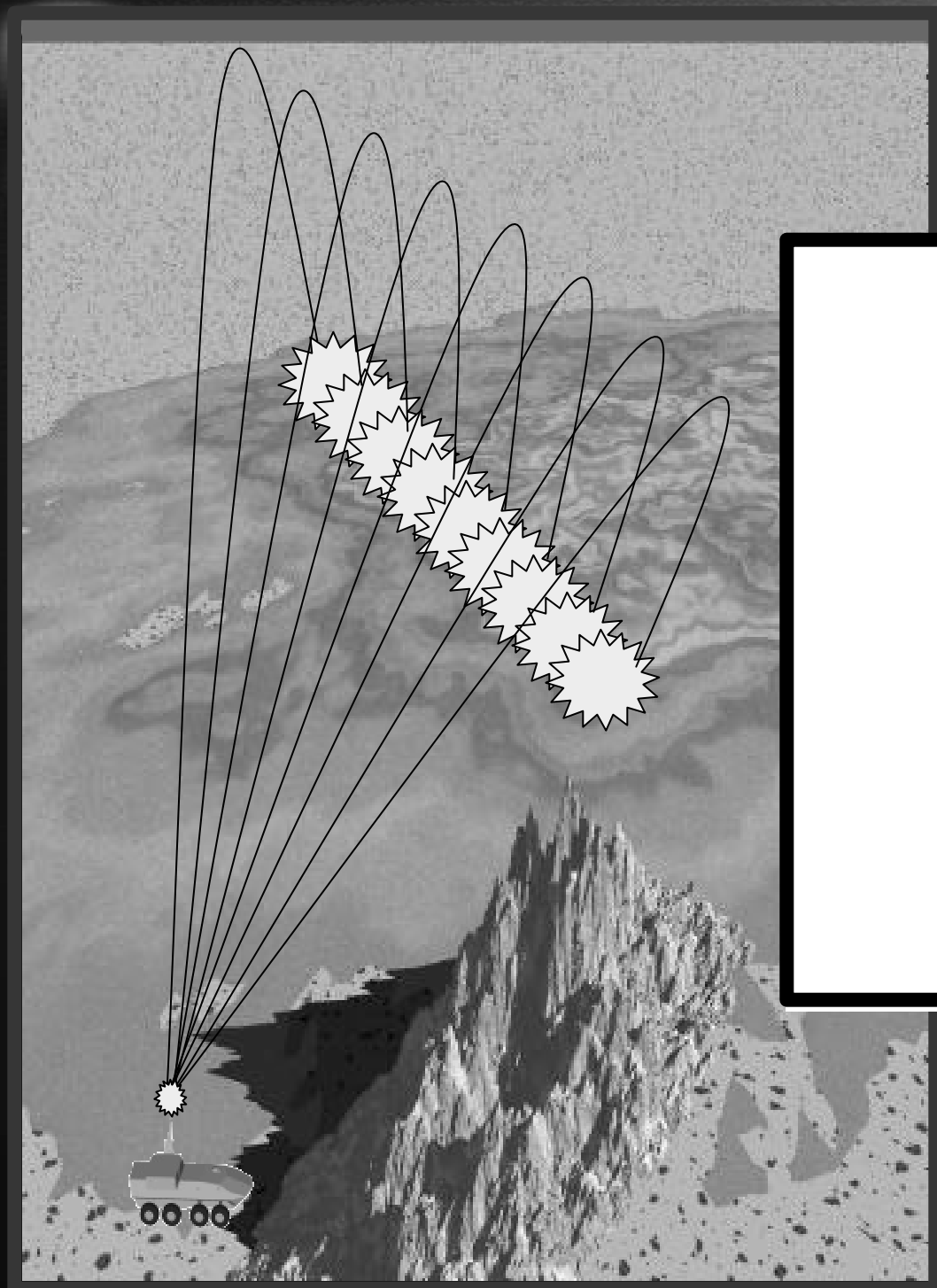


Fire Support Armaments Center



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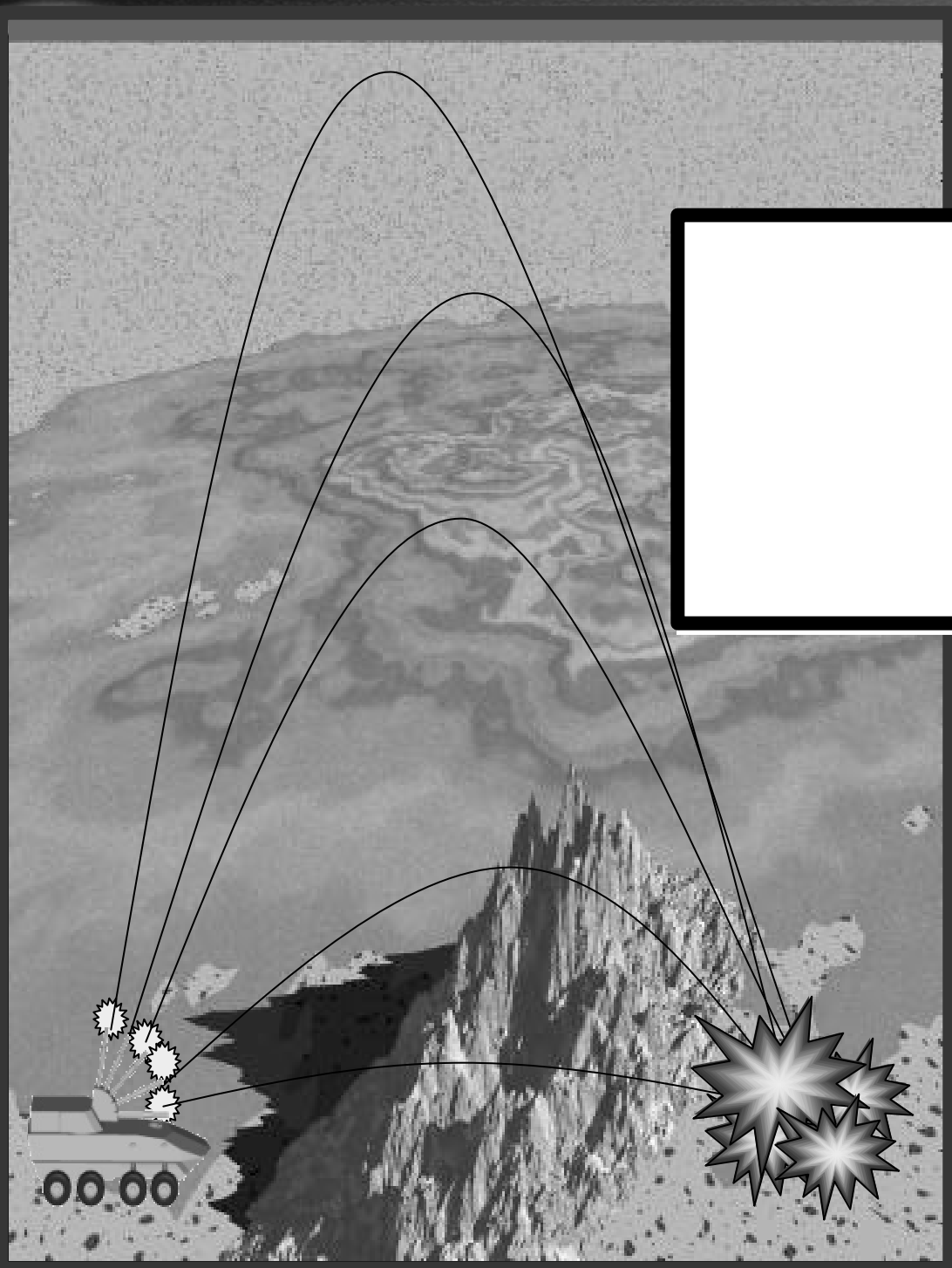

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RAMM is Evolutionary continued

<u>Obtainable</u> Growth Potential

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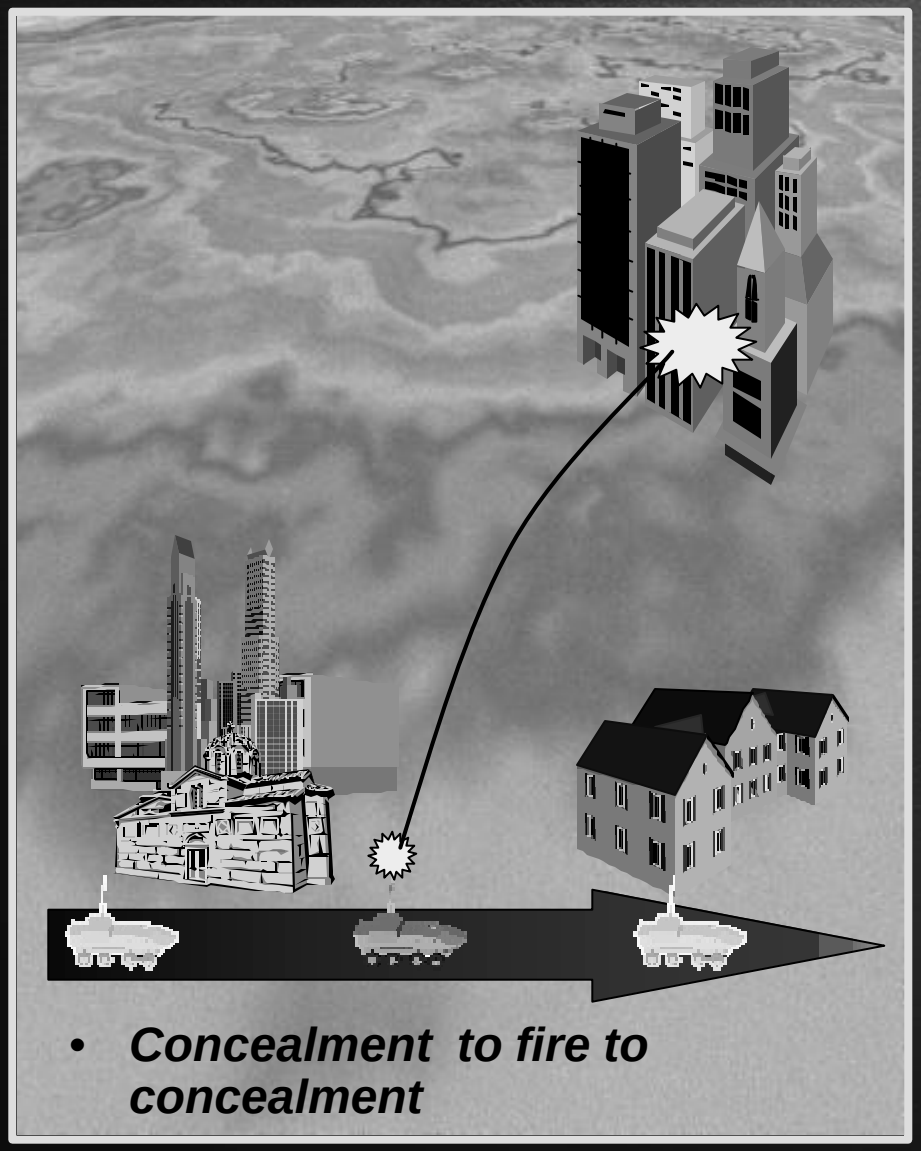
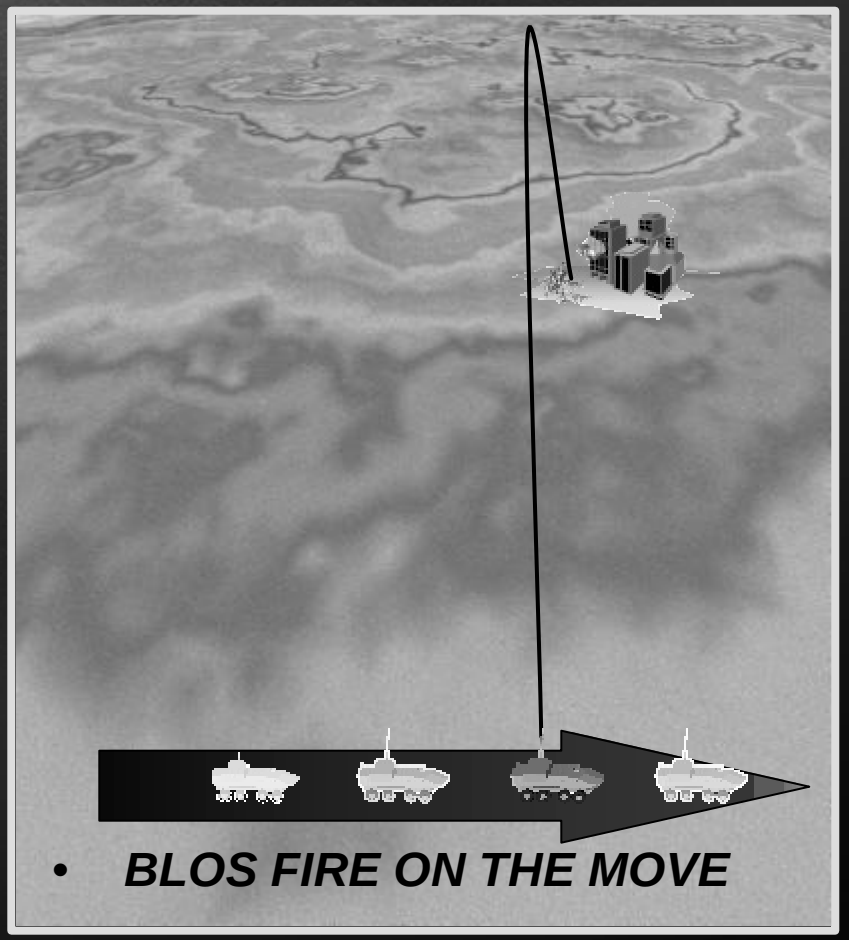
Advanced Survivability Tactics for FCS made possible through software enhancements



- ***Concealment to fire to concealment***



- ***BLOS FIRE ON THE MOVE***

Responsive Accurate Mission Module (RAMM) Technologies To Be Developed

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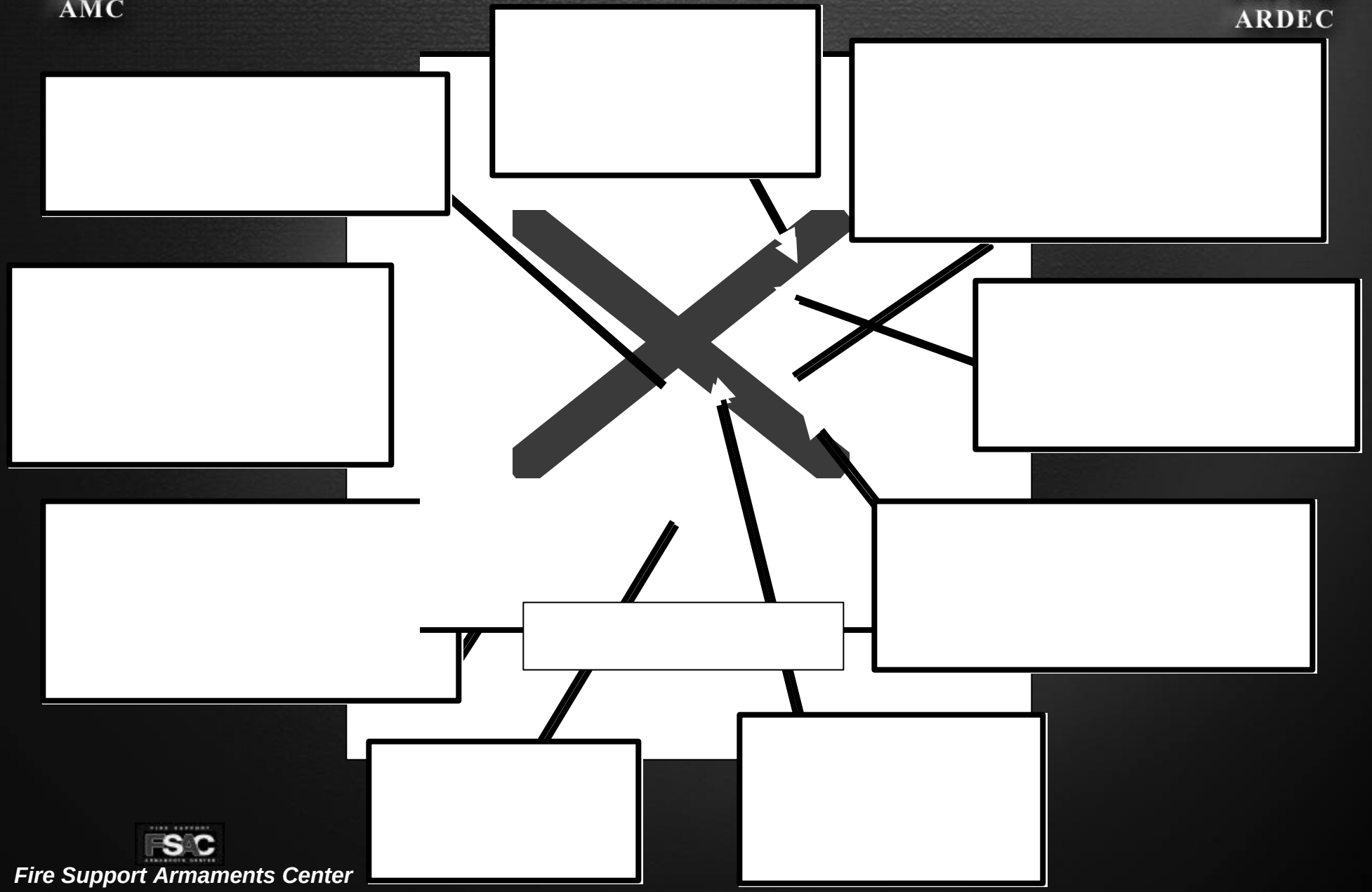

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Program Plan
Overall Project Schedule

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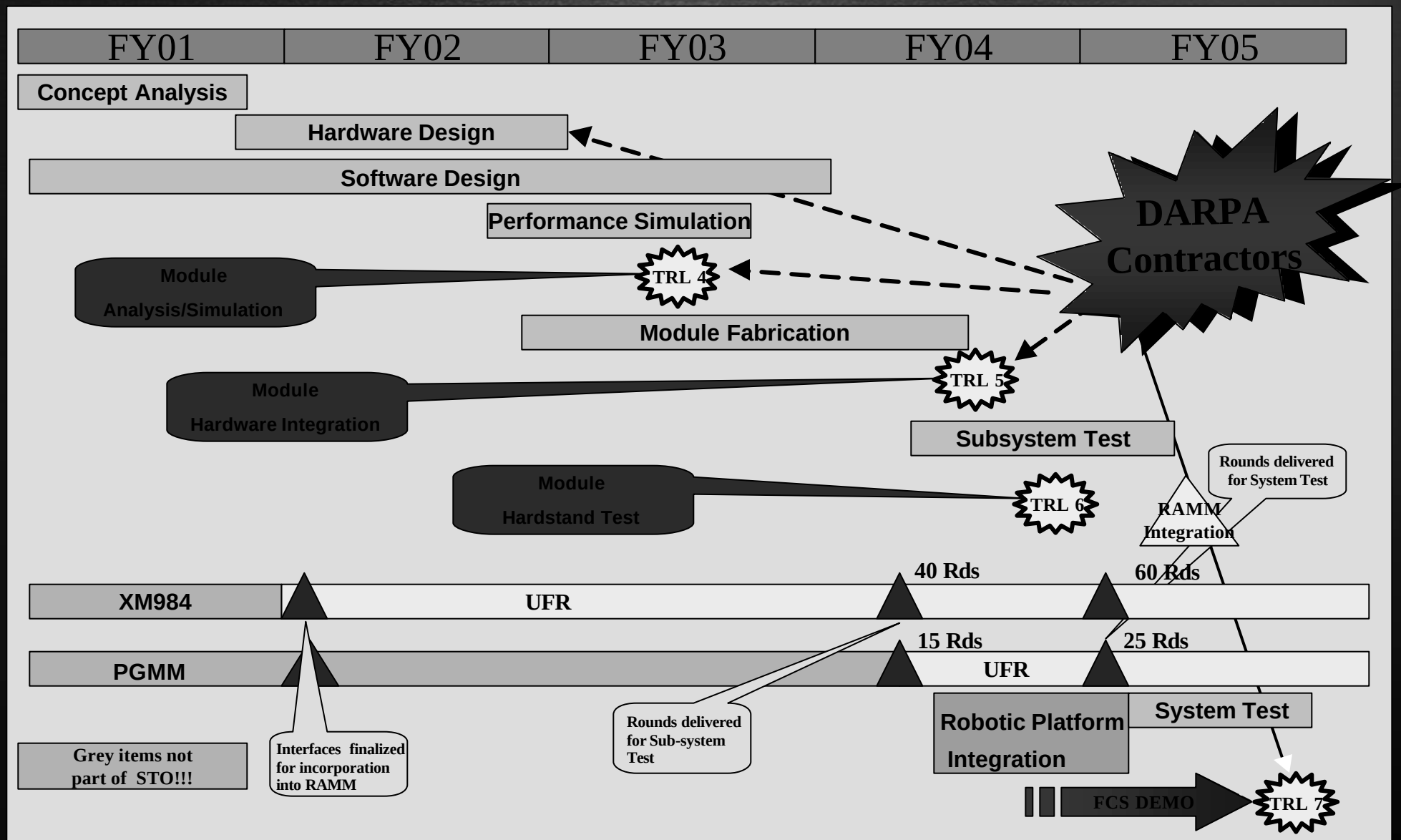

Summary

Value to Future Combat Systems

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Modular- ***Integrate onto many FCS platforms*** (mobile unmanned/manned vehicle or towed trailer)

Survivable- Unmanned, the soldier can remotely ***conduct the mission safe from enemy fire.***

Optimized Fire Effects- Accurate to benefit from pre-programmed impact effects, optimal stowed round usage for ***reduced logistics***

Responsive- After call for fire ***round is in the air in seconds*** as opposed to minutes with current systems

Economical- **Low round cost**, Interoperable with many NATO rounds, Advanced projectiles development mature

Revolutionary- RAMM will **introduce practical remotely operated weaponry to future warfighting**

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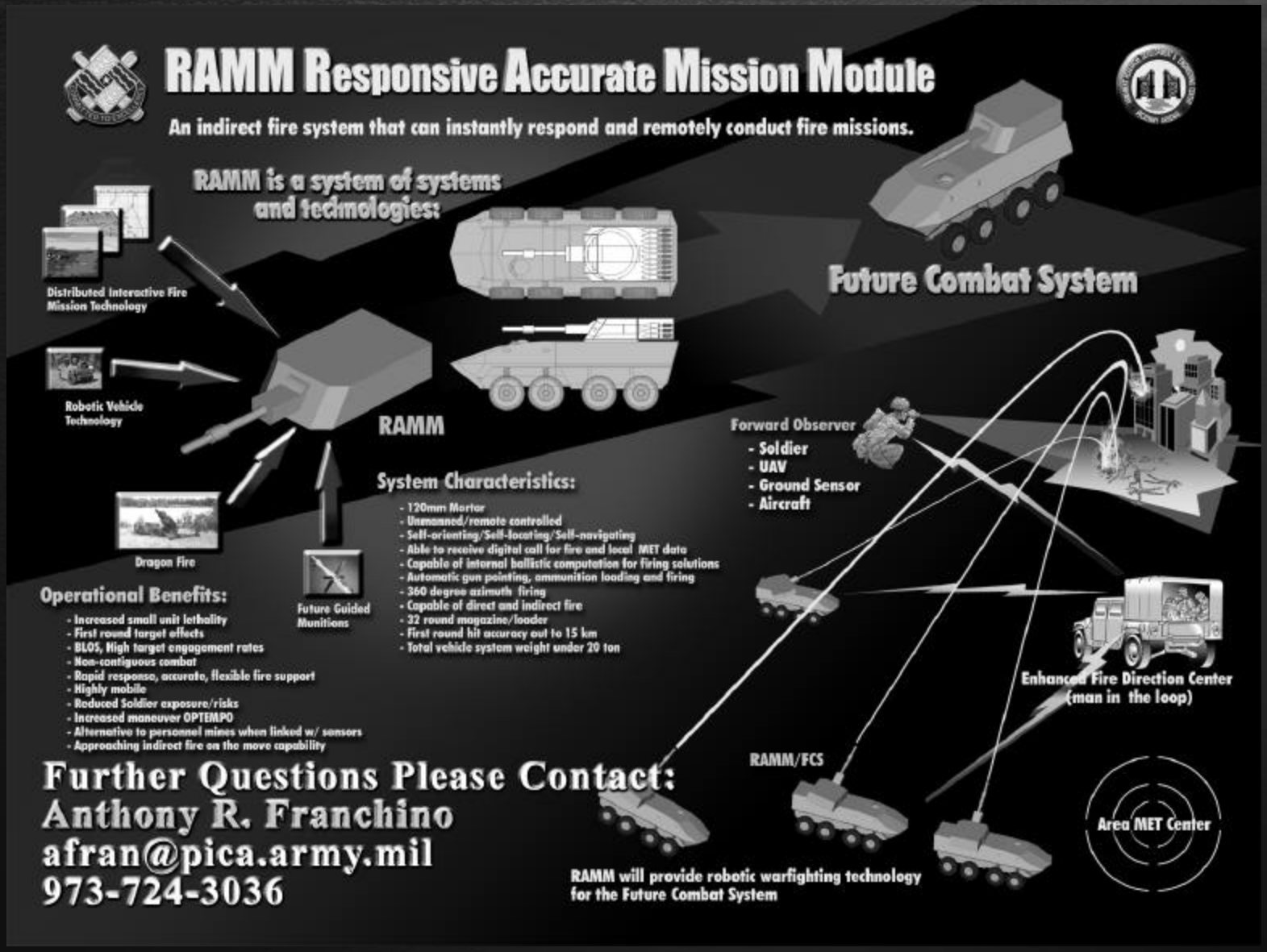
RAMM Responsive Accurate Mission Module

An indirect fire system that can instantly respond and remotely conduct fire missions.



System Characteristics:

- 120mm Mortar
- Unmanned/remote controlled
- Self-orienting/Self-locating/Self-navigating
- Able to receive digital call for fire and local MET data
- Capable of internal ballistic computation for firing solutions
- Automatic gun pointing, ammunition loading and firing
- 360 degree azimuth firing
- Capable of direct and indirect fire
- 32 round magazine/loader
- First round hit accuracy out to 15 km
- Total vehicle system weight under 20 ton

Operational Benefits:

- Increased small unit lethality
- First round target effects
- BLOS, High target engagement rates
- Non-contiguous combat
- Rapid response, accurate, flexible fire support
- Highly mobile
- Reduced Soldier exposure/risks
- Increased maneuver OPTEMPO
- Alternative to personnel mines when linked w/ sensors
- Approaching indirect fire on the move capability

Further Questions Please Contact:

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